Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

CLASSIFICATION RESTRICTED
SECURITY INFORMATION
CENTRAL INTELLIGENCE AGENCY

INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT
CD NO.

STAT

COUNTRY USSR

SUBJECT Economic - Coal

DATE OF INFORMATION 1949

HOW PUBLISHED Book

DATE DIST. 14 Apr 1952

WHERE PUBLISHED Moscow/Leningrad

NO. OF PAGES 33

DATE PUBLISHED 1950

LANGUAGE Russian

SUPPLEMENT TO REPORT NO.

THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF ESPIONAGE ACT 50 U. S. C., 31 AND 32, AS AMENDED. ITS TRANSMISSION OR THE REVELATION OF ITS CONTENTS IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW. REPRODUCTION OF THIS FORM IS PROHIBITED.

THIS IS UNEVALUATED INFORMATION

SOURCE Spravochnik Inzhenera i Tekhnika po Otkrytym Gornym Rabotam (Engineer and Technician's Handbook on Open-Pit Mining) Ugletekhizdat, 1950, 464 pp

STAT

OPEN-PIT MINING OPERATIONS IN THE USSR

This report consists of a series of tables dealing with open-pit mining. These tables describe economic characteristics and effectiveness of coal-mining equipment used in various open-pit mining systems, drilling and blasting operations, excavator and scraper operations, hydraulic mining and excavation, and transport of overburden and coal. In addition, coal-mining operations are compared with other types of mining and excavation. In a number of cases the name of the plant manufacturing the particular machine is given.

The original text available in CIA, contains diagrams of the following mining machinery and operations: nontransport removal of overburden (page 121), cable drilling machine (page 153), drilling and fishing tools used in connection with cable drilling machine (page 155), BSU-150 drilling machine (page 165), and rotary drilling machine for horizontal boreholes (page 168).

In the Table of Contents following, Arabic numerals refer to tables.

TABLE OF CONTENTS

I. Systems of Open-Pit Mining

1. Types of Operations in Pits and the Most Commonly Used Equipment
2. Height of Benches in Some Open-Pit Operations
3. Depth of Some Open-Pit Operations
4. Maximum Amount Removed by Simpler Form of Excavation With Heavy Dragline
5. Engineering-Economic Indexes in Transport and Nontransport Systems for Some Deposits

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

STAT

II. Drilling and Blasting Operations

6. Characteristics of Two-Stage Piston Compressors

7. Characteristics of Mobile Compressors

8. Technical Characteristics of Cable Drills

9. Productivity of Cable Drills in Open-Pit Coal Mines

10. Productivity of Rotary Drills in Open-Pit Coal Mines

11. Consumption of Explosives per Cubic Meter of Rock and Ton of Coal During Blasting of Holes With Core Charges

12. Consumption Norms of Explosives (Kilograms) per 1,000 Tons of Coal Output and 1,000 Cubic Meters of Stripping in Coal Pits

III. Excavator and Scraper Operations

13. Technical Characteristics of Single-Bucket Excavators

14. Technical Characteristics of Draglines

15. Fuel Consumption of Excavators

16. Consumption of Lubrication and Coating Materials by Excavators in an 8-Hour Shift

17. Yearly Productivity of Single-Bucket Excavators of One-Cubic-Meter-Capacity in Coal Pits

18. Productivity of Open-Pit Excavators in the Korkino Lignite Pits

19. Productivity of Mining Excavators per Cubic Meter of Bucket in Pit No 1 of the Korkinugol' Trust

IV. Hydraulic Engineering Operations

20. Most Used Hydromonitors

21. Productivity of Hydraulic Units in Summer and Winter

22. Time Consumed in Hydraulic Mining Operations

23. Time Factors Involved in Use of Hydraulic Mining Machinery

24. Actual Productivity of Hydraulic Mining Installations per Workday

25. Actual Consumption of Water per Cubic Meter of Rock During Hydraulic Mining and Excavation

26. Indexes in Hydraulic Transportation and Hydraulic Mining at Different Pressures According to Data of the Korkinugol' Trust

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

V. Transport of Overburden and Coal in Open-Pit Mining

27. Length of Railroad Tracks in Relation to Overburden and Coal Mines

28. Productivity of Steam-Locomotive-Drawn Trains in Stripping Operations of the Vakhrushevugol' Trust

29. Productivity of Steam-Locomotive-Drawn Trains in Stripping Operations in Coal Industry

30. Volume of Hauling in a 24-Hour Period per Dump Car in Coal Industry

31. Productivity and Unloading Time of Steam-Locomotive-Drawn Trains in Stripping Operations of the Korkinugol' Trust

32. Technical Characteristics of Dump Trucks for Open-Pit Mining

I. SYSTEMS OF OPEN-PIT MINING

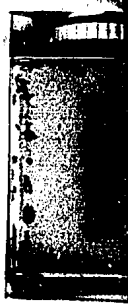
1. Types of Operations in Pits and the Most Commonly Used Equipment

Type of Operation	Equipment	Purpose
Working of bench and loading of rock	Single-bucket and multiple excavators	Excavating bench rock, loading waste rock and minerals onto conveyers, and working on terraces
	Floating single-bucket excavators, bucket excavators	Excavation; loading minerals onto ships and barges when working underwater pits
	Cable-tower excavators, cable scrapers	Working and transporting rock and minerals, terrace work, loading in bunkers, moving to storage places, and loading on to conveyers
	Grader elevators	Loading rock onto motor vehicles
	Tractor scrapers	Working waste rock or minerals and transporting them

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

STAT



Type of Operation	Equipment	Purpose
	Hydromonitors	Working of waste rock or minerals; getting sand and gravel from under water.
	Excavating pumps	Transporting of rock and minerals by pipe
Friable rock	Cable and rotary drilling units, pneumatic drills	Boring holes for blasting
	Hammer drills, hammer picks	Loosening rocky and hard earth
Rock transport	Rail vehicles: mine cars, dump cars, locomotives and electric locomotives	Transporting waste rock to the dump, minerals to the concentrating point, and the sorted product to transhipping bunkers and storage bins
	Motor transport: Motor dump trucks, tow truck tractors with trailers, tractors with trailers	
	Hydraulic conveyers: gravity trough, forced pipe	
Stowing waste rock in the dump	Banking plows, multibucket excavator-loader	Mechanization of dump operations
	Draglines, power shovels, bulldozers	
	Track lifters	Lifting railroad tracks when developing terraces
	Hydromonitors	Forming terraces
Moving, laying, and lifting railroad tracks	Continuous-and intermittent-operation track movers, cranes, track lifters, track-laying machines	Moving, lifting, and laying railroad tracks

2. Height of Benches in Some Open-Pit Operations

Location of Open Pits	Minerals Obtained	Ht of Bench (m)
Magnitogorsk	Iron ore	10-12
Goroblagodatskiy	Iron ore	16
Bakal	Iron ore	16-28
Sukhoy Log	Limestone	10-12
Yelenovka	Limestone	12

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Location of Open Pits	Minerals Obtained	Ht of Bench (m)
Bazhenovskiy	Asbestos	7.5 - 10 - 16
Vakhrushi	Lignite	Along rock 9.0-12.0 Along coal 10.0-25.0
Volchansk	Lignite	Along rock 4.5-9.2 Along coal 5.0-20.0
Karaganda	Lignite	Along rock 8.0-17.0 Along coal 10.0-14.0
Angren	Lignite	Along rock 14.0 Along coal 10.0
Korkino	Lignite	Along rock 10.0-12.0 Along coal 10.0-20.0
Khramtsovskiy	Coal	Along rock to 19.5 Along coal 5.0-6.0

3. Depth of Some Open-Pit Operations

Location of Open Pits	Mineral	Depth of Open-Pit Operations(m)
Bazhenovskiy (plan)	Asbestos	80-100
Kounrad (plan)	Copper	240
Korkino pits No 1, 2, 3 (1945)	Lignite	130-170
Vakhrushi Pit No 2 (1945)	Lignite	90-105
Volchansk Pit No 1 (1949)	Lignite	40-60

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

4. Maximum Amount Removed by Simplest Form of Excavation With Heavy-Duty Dragline

Thickness of Mineral (m)	Capacity of Dragline Bucket (cu m) 11.5 — Amt Removed (m) When Angle of Dip of Bank Is			14.6 — Amt Removed (m) When Angle of Dip of Bank Is			19.2 — Amt Removed (m) When Angle of Dip of Bank Is			23.0 — Amt Removed (m) When Angle of Dip of Bank Is		
	35°	40°	45°	35°	40°	45°	35°	40°	45°	35°	40°	45°
1	16.8	18.8	20.8	13.5	15.2	16.9	11.4	12.8	14.2	10.0	11.2	12.5
3	16.3	18.3	20.3	13.1	14.7	16.3	11.0	12.3	13.7	9.4	10.5	11.7
5	15.9	17.9	19.9	12.7	14.3	15.8	10.6	11.9	13.2	9.0	10.2	11.2
7	15.5	17.4	19.3	12.3	13.8	15.3	10.2	11.4	12.7	8.6	9.6	10.7
10	14.9	16.7	18.5	11.7	13.2	14.6	9.7	10.7	11.9	8.0	8.9	9.9
13	14.1	15.8	17.5	11.1	12.5	13.8	9.0	10.0	11.7	7.4	8.3	9.2
15	13.9	15.6	17.3	10.7	12.0	13.3	8.6	9.6	10.7	7.0	7.8	8.7

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

5. Engineering-Economic Indexes in Transport and Nontransport Systems (Planned Figures) for Some Deposits

Index	Unit of Measurement	Cheremkhovo Deposit Systems		Karaganda Deposit Systems	
		Transport	Nontransport	Transport	Nontransport
Yearly volume of strip work	1,000 cu m	4,000	4,000	4,000	4,000
Yearly volume of coal output	1,000 t	1,200-950	1,200-950	2,300	2,300
Strip coefficient	cu m/t	3.3-4.2	3.3-4.2	1.7	1.7
Gross thickness of strip benches	m	35	35	30	30
Total weight of equipment	t	7,124	2,104	8,935	2,235
Number of workers on the operations	Men	822	250	870	245
Productivity per worker per operation	t	5.0	16.3	9.0	32
Weight of equipment per 1,000 tons of yearly yield	t	6.62	1.96	3.88	0.97

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

II. DRILLING AND BLASTING OPERATIONS

6. Characteristics of Two-Stage Piston Compressors

Plant	No of Cylinders	Type of Compressor	Max Working Pressure (atm)	Vol of Air (cu m/min)	Cyl Dia (mm)	Piston Stroke (mm)	Capacity of Motor (hp)	Cooling Water Consumption (cu m/min)
Borets Plant	1	Horizontal stationary	8	8	450 x 300	300	85	30
Borets Plant	1	Horizontal stationary	7	4	375 x 300	200	38	--
Borets Plant	1	Horizontal stationary	7	12	550 x 425	400	125	--
Borets Plant	1	Horizontal stationary	8	14	550 x 440	400	110	50
Borets Plant	1	Horizontal stationary	8	20	625 x 500	500	155	70
Borets Plant	2	Horizontal stationary	8	30	510 x 300	250	230	100
Sumi Plant imeni Frunze	1	Stationary	8	6	350 x 290	250	51	40
Sumi Plant imeni Frunze	1	Stationary	8	9	430 x 355	300	76	50
Sumi Plant imeni Frunze	1	Stationary	8	17	540 x 450	400	136	85
Sumi Plant imeni Frunze	1	Horizontal stationary	8	35	730 x 415	600	260	163

[Adjoins page 9 here]

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

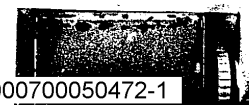
[Adjoins page 8 here]

Sumi Plant imeni Frunze	1	Horizontal stationary	8	80	850 x 500	700	585	370
"Kompressor" Plant	2	Vertical stationary	7	5.5	200	150	45	--
"Kompressor" Plant	2	Horizontal stationary	8	60	730 x 440	450	815	300
Kramatorskiy Plant	1	Stationary	7	30	735 x 550	500	216	150
Plant imeni Lenin	1	Stationary	7	14.5	570 x 425	400	120	60

RESTRICTED

RESTRICTED

STAT



Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

STAT

7. Characteristics of Mobile Compressors

	Type			
	KBE-2		KS-200	
	Piston	VVK-155	Piston	
Productivity, cu m/min	1.75	2.1	4.5	
Working pressure, atm	7	7	6	
Number of stages	2	1	1	
Cylinder diameter, mm	195 x 110	155	200	
Piston stroke, mm	90	110	150	
Revolutions of compressor shaft, rpm	960	960	650	
Cylinder cooling	Air	Air	Air	
Type of installation	Mobile	Mobile on self-propelled mounts		
Type of motor	Electric	Electric	Internal combustion, tractor	Internal combustion
Motor	MKA-206	AT-812	STZ	ZIS-5
Motor capacity, hp	20	30	30	73
Rpm	960	--	960	1,650-2,400
Dimensions, mm				
Length	1,490	1,820	2,040	2,220
Weight	3,290	2,830	4,300	6,000
Width	1,700	1,450	1,680	1,880
Total weight of installation, kg	1,695	1,765	2,500	4,500

8. Technical Characteristics of Cable Drills

Model / Characteristics	Uralets BU-2	22-T	29-T	42-T	271-FT
Weight of tool, kg					
Rated	1,400	700	1,350	2,700	1,000
Working	1,000	700	1,000	2,000	800

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

STAT

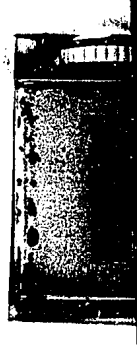
Model	Uralets BU-2	22-T	29-T	42-T	271-FT
Characteristics					
Height of tower from the ground to the crown block axis, m	11.6	10.5	11.6	14.5	11.6
Lift weight of drill tool, m					
Maximum	1.10	0.9	1.10	1.20	1.05
Working	0.95	0.75	0.95	0.95	0.85
Minimum	0.45	0.6	0.45	0.60	0.55
Motor capacity, kw	16.5	7.4	14.7	29.5	14.7
Cable diameter, mm	19	16	19	22	19
Weight of drill, t	11.1	5.4	10.8	20.5	7.5
Dimension of drill					
Tower lowered					
Height, m	3.5	2.6	3.5	4.1	2.8
Length, m	11.1	10.5	11.1	14.0	11.1
Width, m	2.7	2.6	2.7	3.5	2.2
Tower raised					
Height, m	12.0	10.9	12.0	15.0	11.9
Length, m	6.0	3.7	6.0	6.9	4.8

9. Productivity of Cable Drills in Open-Pit Coal Mines (Average figures for 1947-1948)

Trust, Pit	Wt of Drill Tool (kg)	Hole Dia (mm)	Type of Rock or Coal	Production per Shift (m)
Vakhrushevugol' Trust	720	150	Argillite	20.45
Vakhrushevugol' Trust	460	150	Argillite	13.8
Korkinugol" Trust	400	150	Sandstone	10.4
Korkinugol' Trust (Pit No 2)	400	150	Coal	12.2

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1



Trust, Pit	Wt of Drill Tool (kg)	Hole Dia (mm)	Type of Rock or Coal	Production per Shift (m)
Karagandaugol' Trust (Pit No 4)	410	150	Sandstone	13.9
Karagandauglerazrez Trust (Pit No 4)	410	150	Coal	17.8
Kirovugol' Trust	500	150	Sandstone	10-12

BSU-150 Drill on Caterpillar Treads

Weight of drill, kg	5,000
Caterpillar tread	STZ-NATI
Pressure on ground, kg/sq cm	0.43
Moving speed km/hr	1.5
Capacity of drilling motor	17.0
Motor capacity for lifting and moving the reduction unit, kw	9.1
Reduction unit spindle revolutions, rpm	148-304
Depth of drilling, m	Up to 50
Hole diameter mm	150

10. Productivity of Rotary Drills in Open-Pit Coal Mines

Trust, Pit	Type of Drill	Hole Dia (mm)	Type of Rock or Coal	Production of Drill (m per shift)
Vakhrushevugol' Trust				
Pit No 2	Levkovskiy	180	Coal	41.5
Pit No 2	Levkovskiy	150	Argillite	25.25
Pit No 2	PBS-110	125	Frozen earth	14.3
Volchanskugol' Trust				
Pit No 1	Matushkin	150	Coal	26.5
Pit No 2	PBS-110	125	Coal	40.4
Karagandauglerazrez Trust				
Pit No 4	PBS-110	125	Coal	42.1
Pit No 1-2	PBS-110	125	Frozen earth	11.2

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

STAT

11. Consumption of Explosives per Cubic Meter of Rock and Ton of Coal During Blasting of Holes With Core Charges (Average figures for 1947-1948)

Pit	Type of Rock or Coal	Method of Explosives Operations	Consumption of Explosives (kg) Per Ju M of Rock (exploded vol)	Per Ton of Coal
Vakhrushevugol' Trust				
Pit No 2	Coal	Charge inserted in holes	--	0.223
Pit No 1,3 and 5	Coal	Charge inserted in holes	--	0.162
Strip working	Argillite	Charge inserted in holes	0.144	--
Volchanskugol' Trust				
Pit No 1	Coal	Charge inserted in holes	--	0.181
Pit No 2 bis	Coal	Charge inserted in holes	--	0.208
Korkinugol' Trust				
Pits No 1,2 North, and 2 South	Coal	Charge inserted in holes	--	0.240
Strip working	Sandstone	Charge inserted in holes	0.214	--
Karagandauglerazrez Trust				
Pit No 4	Sandstone	Charge inserted in holes	0.118	--
Pit No 4	Coal	Charge inserted in holes	--	0.150
Pit No 1-2	Coal	Charge inserted in holes	--	0.185
Kirovugol' Trust	Sandstone	Charge inserted in holes	0.30	--
Kirovugol' Trust	Coal	Small blast holes	--	0.142

12. Consumption Norms of Explosives (kilograms) per 1,000 Tons of Coal Output and 1,000 Cubic Meters of Stripping in Coal Pits

Combine	Consumption Norm
Chelyabinskugol'	
For coal mining	200
For stripping	120
Sverdlovskugol'	
For coal mining	200
For stripping	80

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

STAT

Combine	Consumption Norm
Karagandaugol'	
For coal mining	150
For stripping	100
Vostsibugol'	
For coal mining	150
For stripping	250
Sredazugol'	
For coal mining	200
For stripping	100
Khabarovskugol'	
For coal mining	150
For stripping	70

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

III. EXCAVATOR AND SCRAPER OPERATIONS

13. Technical Characteristics of Single-Bucket Excavators

Index	Unit of Measure	E-505	F 302	OM-201	E-751	E-1003	SE-3	EOL-15		
Bucket capacity	cu m	0.5	0.5	0.5	0.75	1.00	3.0	10	15	25
Length of boom	m	5.5	5.7	5.7	6.9	6.7	10.5	45	34	34
Length of dipper stick	m	4.6	4.5	4.2	4.52	4.9	7.2	24.7	19.5	18
Angle of inclination of boom	deg	45	45	45	45	45	45	45	45	45
Digging radius at ground level	m	4.8	5.2	4.7	--	6.4	8.23	29	20.5	--
Maximum digging radius	m	7.9	8.8	7.9	8.86	9.8	14.2	49.4	40	38.5
Maximum unloading radius	m	7.2	8.32	7.2	8.04	8.7	12.76	47.47	37.5	25
Maximum digging height	m	6.6	6.49	6.0	7.63	8.0	9.68	41.3	30	29.3
Maximum unloading height	m	4.6	4.71	4.2	5.33	5.5	6.66	36	24.5	23.5
Power source		Diesel KDM-46	Diesel KDM-46	Diesel KDM-46	Electric motor AM-114-8	Electric motor	Multiple electric-motored	Multiple electric-motored		
Engine capacity (drive)		80 hp	80 hp	80 hp	55 kw	80 kw	250 kw	1,700 kva		

[Adjoins page 16 here]

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

[Adjoins page 15 here]

Capacity of lift motor		--	--	--	--	--	175 hp	550 x 2 kw
Capacity of turn motor		--	--	--	--	--	2 x 50 kw	250 x 2 kw
Capacity of thrust motor		--	--	--	--	--	54 kw	180 kw
Capacity of motor for opening bucket bottom		--	--	--	--	--	4.1 kw	--
Capacity of travel motor		--	--	--	--	--	54 kw	80 x 4 kw
Number of caterpillars		2	2	2	2	2	2	8
Length of caterpillar track	mm	3,520	3,720	3,541	3,750	4,100	6,000	16,500
Tread	mm	2,850	2,850	2,760	3,000	3,200	5,200	13,300
Width of caterpillar belt	mm	550	530	510	625	675	900	1,100
Pressure on ground	kg/sq cm	0.61	0.78	0.82	0.85	0.89	1.8	2.33
Moving speed	km/hr	1.65-3.2	1.18	1.8-3.7	0.86	1.0-2.2	1.4	0.3

[Adjoins page 17 here]

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

[Adjoins page 16 here]

Working weight (shovel with rig)	t	22.1	25.6	25.2	31.5	37.7	165	1,017
Average productivity	cu m/hr	60-75	50-60	60-70	60-75	100-130	200-250	--
Radius of body rotation	m	2.9	--	2.73	--	--	5.25	12.0
Manufacturing plant		Kovrov Excavator Plant	Tashkent Excavator Plant	Plant imeni Molotov	Kostroma Rabochiy Metallist Plant	Voronezh Excavator Plant imeni Komintern	Uralmash Plant imeni Ordzhonikidze	Novo-Kramatorsk Plant imeni I.V. Stalin

RESTRICTED

RESTRICTED

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

14. Technical Characteristic of Draglines

Index	Unit of Measure	E-1003		ESh-1	ESh-10/75								
Bucket capacity	cu m	1		3.4	22	18	--	14		10			
Length of boom	m	13	16	37.6	55	60	--	65		75			
Angle of inclination of boom	deg	30	30	35	20	30	20	30	20		30		
Maximum unloading height	m	4.2	5.7	17.7	--	--	16	28	20		32		
Maximum unloading radius	m	12.8	15.4	33.8	--	--	68	62	77		71.5		
Maximum radius digging	m	15.1	17.8	40	--	--	76.5	74.5	94		85		
Maximum depth digging	m	9.5	12.2	19.8	--	--	45			50			
Travel		Caterpillar		Walking				Walking					
Dimensions		3.46		5,012	--		--	11		--			
Height of cab	mm												
Turning radius of cab	mm	3.3		9,620	--		--	14.5		--			
Tread	mm	3.2		10,250	--		--	19.3		--			
Width of feet	mm	--		1,220	--		--	2.5		--			
Length of feet	mm	--		7,600	--		--	16.3		--			
Base diameter	mm	--		7,330	--		--	14.0		--			
Base area	sq m	--		42.2	--		--	153.9		--			
Bucket lift speed	m/sec	1.23		0.876	--		--	1.6		3.2			

[Adjoins page 19 here]

STAT

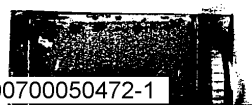
Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

/Adjoins page 18 here/

Bucket drawn-in speed	m/sec	0.8	0.805	--	--	1.80	2.25
Turn speed	rpm		1.36	--	--	1.25	
Voltage	v	--	380	--	--	3,000-6,000	
Line power motor	kw	80	--	--	--	1,370	
Lift power motor	kw	--	280	--	--	500 x 2	
Draw-in motor power	kw	--	--	--	--	500 x 2	
Turn motor power	kw	--	40	--	--	200 x 2	
Boom winch motor power	kw	--	--	--	--	16	
Travel mechanism motor power	kw	--	--	--	--	250 x 2	
Weight	t	43	169.2	--	--	1,050	
In operation	kg/sq cm	--	0.4	--	--	0.73	
In motion	kg/sq cm	--	--	--	--	1.2	
Step of excavator	m	--	--	--	--	2	
Travel speed	km/hr	1.47	0.33	--	--	0.25	

STAT



Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

15. Fuel Consumption of Excavators
(According to S. M. Shorokhov)

Types of Excavator and Tractor	Bucket Capacity (cu m)	8-Hour Shift Consumption		
		Water (cu m)	Coal With Calorific Values of 6,800 Calories per Ton	Gas oil, Solar Oil (kg)
Universal	0.5	--	--	35-45
	1.0	4.5-5.5	0.8-1.0	65-80
	1.5	6.0-7.0	1.1-1.3	90-110
	2.3	6.5-8.0	1.1-1.5	--
	3.0	8.0-11.0	1.4-1.9	--
Open-pit mine	4.6	18.0-25.0	2.8-4.0	--

16. Consumption of Lubrication and Coating Materials by Excavators in an 8-Hour Shift (kilograms)
(According to S. M. Shorokhov)

	Single-Bucket Excavators			Multibucket Excavators
	Diesel, 0.5-2 cu m	Electric, 0.5-3.0 cu m	Steam, 0.5-3 cu m	Electric, 600-800 liters
Motor oil	4.0-7.0	--	--	--
Viskosin	--	--	0.8-2.8	--
Machine oil (Solidol)	0.5-1.6	0.5-1.5	1.0-3.8	1.0-1.2
Kerosene	0.2-0.5	0.2-0.5	0.3-0.7	0.5-0.8
Residues	0.4-0.8	0.4-0.8	0.7-1.2	1.0-1.5
Total	6-12.0	2.0-5.0	3.5-11.0	6.5-9.5

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

17. Yearly Production of Single-Bucket Excavators of One-Cubic-Meter Capacity in Coal Pits (for 1947)

Trust, Pit	Bucket Capacity (cu m)	Type of Transportation	Type of Rock or Coal	Yearly Production of Excavators per Cu M of Bucket Capacity (1,000 cu m)
Vakhrushevugol' Trust				
Coal Pits No 1, 2, 3, 5	1.5; 1 1.0 0.5	Belt conveyer	Lignite of average hardness	250
Volchanskugel' Trust				
Pits No 1, 2 bis, 4	0.5	Belt conveyer	Lignite of average hardness	213
Kirovugol' Trust				
Khramtsovskiy Pit No 1	3.44	Standard-gauge railroad	Clay, sandstone, argillite	290
" " " 1	3.00	Standard-gauge railroad	Clay, sandstone, argillite	195
" " " 1	1.91	Standard-gauge railroad	Clay, sandstone, argillite	283
" " " 1 bis (east wing)	1.5	Standard-gauge railroad	Clay, sand	97
" " " 1 bis (east wing)	1.5	Standard-gauge railroad	Carbon black	82
Karagandauglerazrez Trust				
Pit No 1-2	4.5	In strip pits non-transport method	Clay, clayey shale	363
" " 4	3.8	Standard-gauge railroad	Clay, clayey shale	305
" " "	1.7	Standard-gauge railroad	Clay, clayey shale	283
" " "	2.0	Standard-gauge railroad	Clay, clayey shale	262

[Adjoins page 22 here]

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

(Adjoins page 21 here)

Pits No 1-2	1.5	Narrow-gauge railroad	Lignite	176
Pits No 4	2.0	Standard-gauge railroad	Lignite	306
" " "	1.7	Standard-gauge railroad	Lignite	326
" " "	1.35	Standard-gauge railroad	Lignite	318
" " "	1.0	Standard-gauge railroad	Lignite	292

18. Productivity of Open-Pit Excavators in the Korkino Lignite Pits

Quarter	1943		1944		1945	
	No of Shifts Completed With One Excavator	Productivity per Cu M of Bucket Capacity (1,000 cu m)	No of Shifts Completed With One Excavator	Productivity per Cu M of Bucket Capacity (1,000 cu m)	No of Shifts Completed With One Excavator	Productivity per Cu M of Bucket Capacity (1,000 cu m)
I	149.7	29.2	178.6	46.1	179.0	43.4
II	211.4	60.4	188.2	61.4	204.7	61.4
III	201.9	66.7	197.7	65.5	186.1	54.8
IV	211.5	51.2	162.9	49.9	179.0	40.8
Total	774.5	207.5	727.4	222.9	748.8	200.8

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

19. Productivity of Mining Excavators per Cubic Meter of Bucket in Pit No 1 of the Korkinugol' Trust

Coal Transport From Excavators by Belt Conveyers

Quarter	1944		1945	
	No of Shifts Completed	Production, (1,000 cu m)	No of Shifts Completed	Production (1,000 cu m)
I	205.0	95.4	227.0	89.0
II	207.0	110.8	238.4	104.7
III	236.8	106.2	221.3	107.7
IV	221.2	95.6	228.9	108.4
Total	870.0	408.0	915.6	409.8

IV. HYDRAULIC ENGINEERING OPERATIONS

20. Most Used Hydromonitors

Type of Hydromonitor	Dia of Intake (mm)	Dia of Nozzles (mm)	Wt (kg)
Trud Plant No 7	175	50, 63, 76, 89	177
Trud Plant No 9	225	75, 89, 102, 114	236
Giproorgstroya	175	50, 63, 76, 89	400
Gidromekhanizatsiya Trust	250	63, 76, 89, 102, 114, 127	440
Gidrotorf	100	25, 37, 43	450

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

21. Productivity of Hydraulic Units in Summer and Winter

Pit	Types of Excavating Pump	Mean 24-Hour Production (in cu m) Summer	Winter	Lowering of Productivity Under Winter Conditions (percent)
Lyutoricheskiy	ZGM	3,900	1,600	59
Vakhrushi No 4	ZGM	2,100	1,200	43
Volchansk	6NZ	1,000	550	45

22. Time Consumed in Hydraulic Mining Operations

Operation	No of Days Worked per Year Max	Min	Avg
Hydraulic mining in the coal industry (average)	207	120	136
In coal pits			
Korkinugol' Trust	224	70	139
Vakhrushevugol' Trust	190	50	120
In Lyutoricheskiy pit	293	231	276
Hydraulic excavation at Dneprostroy	326	268	297
Hydraulic excavation on Volga-Moscow Canal	279	89	159

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

23. Time Factors Involved in Use of Hydraulic Mining Machinery

Hydraulic Mining Operation	Breakdown of Work and Idle Time of Installations (percent)		Breakdown of Idle Time (percent)				
	Net Working Time	Idle Time	Lack of Elec Power	Transferring of Equipment	Repair	Break-down	Other Causes
Hydraulic mining in coal industry (average)	54.0	46.0	12.6	9.0	4.2	12.2	8.0
In pits							
Korkinugol' Trust	56.0	44.0	3.2	7.0	6.0	10.8	18.0
Vakhrushevugol' Trust	54.0	46.0	22.0	2.1	2.5	14.8	4.1
In Lyutoricheskiy Pit	58.0	42.0	1.0	12.0	3.1	11.0	14.9
Hydraulic Excavation at Dneprostroy	82.5	17.5	--	12.0	4.0	--	1.5
Hydraulic Excavation on the Volga-Moscow Canal	59.0	41.0	Idlessness due to outside causes		Idlessness due to defects of machinery		
Sluice hydraulics	77.0	23.0	18.0		5.0		
Elevator hydraulics	56.0	18.0	16.0		28.0		

RESTRICTED

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

23. Time Factors Involved in Use of Hydraulic Mining Machinery

Hydraulic Mining Operation	Breakdown of Work and Idle Time of Installations (percent)		Breakdown of Idle Time (percent)				
	Net Working Time	Idle Time	Lack of Elec Power	Transferring of Equipment	Repair	Break-down	Other Causes
Hydraulic mining in coal industry (average)	54.0	46.0	12.6	9.0	4.2	12.2	8.0
In pits							
Korkinugol' Trust	56.0	44.0	3.2	7.0	6.0	10.8	18.0
Vakhrushevugol' Trust	54.0	46.0	22.0	2.1	2.5	14.8	4.1
In Lyutoricheskiy Pit	58.0	42.0	1.0	12.0	3.1	11.0	14.9
Hydraulic Excavation at Dneprostroy	82.5	17.5	--	12.0	4.0	--	1.5
Hydraulic Excavation on the Volga-Moscow Canal	59.0	41.0	Idlessness due to outside causes		Idlessness due to defects of machinery		
Sluice hydraulics	77.0	23.0	18.0		5.0		
Elevator hydraulics	56.0	18.0	16.0		28.0		

RESTRICTED

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

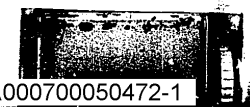
RESTRICTED

24. Actual Productivity of Hydraulic Mining Installations per Workday

Hydraulic Mining Operation	Type of Earth	Productivity (cu m) Max	Avg
Hydraulic mining in coal industry			
With 8NZ excavating pump (average)	Sand, clay, clayey shale	1,640	1,165
With ZGM excavating pump (average)	Pebbles, argillite	4,380	2,350
In pits			
Korkinugol' Trust, 8NZ	Clay, clayey shale	3,100	1,250
" " , ZGM		4,500	2,400
Vakhrushevugol' Trust, 8NZ	Medium and heavy clay	2,500	1,060
" " , ZGM	Pebbles, argillite	3,140	2,100
In Lyutoricheskiy pit, ZGM	Light and heavy clay and clayey soil	6,100	3,450
Hydraulic excavation at Dneprostroy (self-propelled hydraulic units)	Light loess-type clayey soil	3,200	1,700
Hydraulic excavation on Volga-Moscow Canal with one MVS-800 excavating pump	Clay, gravel, clayey soil	6,168	930

RESTRICTED

STAT



Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

25. Actual Consumption of Water per Cubic Meter of Rock During Hydraulic Mining and Excavation

Hydraulic Mining Operation	Type of Earth	Consumption of Water per Cu M		
		Max	Min	Avg
Hydraulic mining in coal industry (average)	Sand, clay, clayey shale, river argillite	20.1	6.9	10.2
In Korkinugol' Trust pits	Clay, clayey shale	12.5	5.9	7.8
In Vakhrushevugol' Trust pits	Average and hard clay, river argillite	34.0	9.5	18.4
In Lyutoricheskiy Pit	Light, hard clay and clayey soil	9.5	5.1	6.9
Hydraulic excavation at Dneprostroy	Light loess-type and clayey soil	4.37	3.4	3.5
Hydraulic excavation on Volga-Moscow Canal	Clay, gravel, clayey soil	18.0	3.0	9.1

26. Indexes In Hydraulic Transportation and Hydraulic Mining at Different Pressures According to Data of Korkinugol' Trust

Indexes	Hydraulic Transportation at Pressure				Hydraulic Mining at Pressure			
	4 Atm		6 Atm		8 Atm		10 Atm	
	Avg	Limits of Fluctuations	Avg	Limits of Fluctuations	Avg	Limits of Fluctuations	Avg	Limits of Fluctuations
Water consumption, cu m per cu m of material								
Sand and moulding clay	7.9	6.7-8.8	5.0	4.6-8.8	--	--	7.0	5.5-8.8
Green-gray compact clay	--	--	7.0	5.4-9.6	--	--	--	--

[Adjoins page 28 here]

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

/Adjoins page 27 here/

Consumption of electric power, kw-hr per cu m of material								
Sand and moulding clay	3.7	3.2-4.2	4.6	3.3-6.9	5.2	4.6-6.9	--	--
Green-gray compact clay	--	--	5.2	2.9-8.1	--	--	10.8	8.7-13.0
Labor productivity in cu m per man-day per production worker								
Sandy and moulding clay	27.0	--	34.0	--	--	--	--	--
Green-gray compact clay	--	--	--	--	--	--	38.0	--
24-hour production of one operating excavating pumping unit of the 8NZ type (200 mm), in cu m of earth								
Sandy and moulding clay	1,800	--	2,000	--	--	--	1,920	--
Green-gray compact clay	--	--	1,920	--	--	--	1,160	--

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

V. TRANSPORT OF OVERBURDEN AND COAL IN OPEN-PIT MINING

27. Length of Railroad Tracks in Relation to Overburden and Coal Mines (as of 1948)

Trust, Pit	Length of Railroads	
	Per Million Cu M of Strip (km)	Per Million T of Output (km)
Vakhrushevugol' Trust	7.8	8.7
Volchanskugol' Trust	13.5	7.2
Karagandauglerazrez Trust	6.925	8.950
Pit No 4	--	--
Angrenugol' Trust	5.8	10.0
Korkinugol' Trust	--	--
Pit No 1	8.0	17.0
Pit No 2		
Pit No 3	10	26.0
Pit No 4		
Severnyy	10.7	25.3
Kirovugol' Trust pits	--	--
Khramtsovskiy No 1 and No 1 bis	7.9	8.7

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

28. Productivity of Steam-Locomotive-Drawn Trains in Stripping Operations of Vakhrushevugol' Trust

Productivity of Steam-Locomotive-Drawn Trains per 24 Hours (cu m)

Quarter	1945 Locomotive Series		1946 Locomotive Series	
	R	E	R	E
I	560	1,000	670	1,000
II	925	1,625	1,375	1,780
III	920	1,400	1,380	1,620
IV	670	1,050	700	1,050

29. Productivity of Steam-Locomotive-Drawn Trains in Stripping Operations in Coal Industry

Characteristics of Steam-Locomotive-Drawn Trains

Trusts, Pit	Type or Series of Steam Locomotives	Load-Lift of Dump Cars (t)	No of Dump Cars in Stock	Length of Haul (km)	Productivity of Steam-Locomotive-Drawn Trains (cu m/24 hr)	Year
Vakhrushevugol' Trust	Ye, E	40	9	5.0	1,137	1947
Vakhrushevugol' Trust	Ye, E	40	12	5.0	1,769	1949
Volchanskugol' Trust	Ye, T	40	7	3.8	813	1947
Volchanskugol' Trust	Ye, T	40	8	3.8	1,348	1949

[Adjoins page 31 here]

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

/Adjoins page 30 here/

Karagandauglerazrez Trust						
Pit No 4	E	40	12	4.2		
	T	40	12	4.2		
	T	40	11	4.2	1,647	1949
	O	40	7	4.2		
Korkinugol' Trust	E, Ye, T	40	6.8	5.0		
Baturino Pit	R, OD	20	8.4	4.	1,024	1949
Kirovugol' Trust	C² 57	40	8	4.0	616	
Khramtsovskiy Pits No 1, 1 bis	Shch	20-40	8	4.0	710	for 1947
						1948

30. Volume of Hauling in a 24-Hour Period per Dump Car in Coal Industry

Trust, Pit	Load-Lift of Dump Car (tons)	Length of Haul(km)	Productivity of One Dump Car (cu m/24 hr)
Vakhrushevugol' Trust	40	5.0	209
Volchanskugol' Trust	40	3.8	138
Korkinugol' Trust			
Korkino Pits	40	5	179
Baturino Pit	20	4	74
Karagandauglerazrez Trust			
Pit No 4	40	4.2	170
Kiroyugol' Trust			
Khramtsovskiy Pits No 1, 1 bis	20-40	4.0	186

RESTRICTED

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

31. Productivity and Unloading Time of Steam-Locomotive-Drawn Trains in Stripping Operations of Korkinugol' Trust

Quarter	Removal of Rock per Train According to Type of Dumping Cars (cu m/24 hr)				Time Required to Unload a Train (minutes) According to No of Dump Cars in Train							
			With Rising Sides*, 20 T		With Rising Sides*, 40 T		With Drop Sides, 40 T		With Rising Sides*, 20 T per Compartment			
									Korkino		Baturino	
	With Rising Sides,* 40 T	With Drop Sides 40 T	Korkino	Baturino	Unloading	No of Dump Cars	Unloading	No of Dump Cars	Unloading	No of Dump Cars	Unloading	No of Dump Cars
I	650	--	350	--	23.5	5.4	--	--	36.5	5.8	--	--
II	1,100	--	550	570	13.0	6.4	--	--	31.0	6.8	32.9	8.1
III	1,132	--	620	760	12.0	6.1	--	--	34.0	7.0	30.7	8.4
IV	960	594	535	695	21.0	5.5	32.4	5.3	35.0	6.5	39.7	8.1
Quarter												
I	857	760	472	857	14.8	6.4	28.5	6.8	29.9	6.4	39.0	8.8
II	1,170	1,537	678	953	12.8	7.6	11.6	8.7	18.3	7.3	30.5	8.9
III	902	1.330	735	924	14.2	7.0	11.6	8.9	19.4	7.4	34.5	8.8
IV	704	882	526	759	20.2	6.2	27.8	7.9	26.3	6.7	42.2	8.3

* Dump cars with rising sides were loaded with moist clayey materials.

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1

32. Technical Characteristics of Dump Trucks for Open-Pit Mining

Index	Unit Measure	Type			
		ZIS-505	MAZ-205	Dump Truck Load Lift, 10 T	Dump Truck Load Lift, 25 T
Carrying capacity	t	3.5	5	10	25
Engine power	hp	90	110	160	300
Type of fuel	--	Gasoline	Diesel	Diesel	Diesel
Number of axles	--	2	2	3	2
Number of driving axles	--	1	1	2	1
Maximum speed	km/hr	60	55	--	--
Loading height	mm	1,950	--	--	--
Tilting of body	--	Backward	Backward	Backward	Backward
Width of tread					
Front wheels	mm	1,700	1,950	--	--
Rear wheels	mm	1,740	1,920	--	--
Radius of turn	m	8.0	9.0	--	--
Tire size	m	9 x 20	12 x 20	--	--
Fuel consumption, per 100 km	liters	30	35	--	--
Manufacturing plant	--	Automobile Plant imeni Stalin	Minsk Automobile Plant	Minsk Automobile Plant	Minsk Automobile Plant

- E N D -

RESTRICTED

RESTRICTED

STAT

Sanitized Copy Approved for Release 2011/09/23 : CIA-RDP80-00809A000700050472-1